6.3 Vehicle Transportation

Vehicles provide transportation for individuals to travel to work, school, public services, and for recreational and commercial purposes. Vehicles also are used for emergency response and for delivering commercial goods and support economic activity. Vehicle delays increase travel time for motorists and can affect quality of life, air quality, and economic growth.

This section describes vehicle transportation in the study area and the potential impacts on vehicle transportation from construction and operation of the proposed export terminal.

6.3.1 Regulatory Setting

Laws and regulations relevant to vehicle transportation are summarized in Table 6.3-1.

Table 6.3-1. Regulations, Statutes, and Guidelines for Vehicle Transportation

Regulation, Statute, Guideline	Description
Federal	
Federal Railroad Safety Act of 1970	Gives FRA rulemaking authority over all areas of rail line safety. FRA has designated state and local law enforcement agencies have jurisdiction over most aspects of highway/rail grade crossings, including warning devices and traffic law enforcement.
Highway Safety Act and the Federal Railroad Safety Act	Gives FHWA and FRA regulatory jurisdiction over safety at federal highway/rail grade crossings.
Railroad-Highway Grade Crossing Handbook (Federal Highway Administration 2007); *Manual on Uniform Traffic Control Devices* (23 USC 109(d))	Guidance document on grade-crossing safety issues, including the selection and placement of warning devices and enforcement of traffic laws. Provides guidelines for traffic control devices including delay, roadway classification, average daily traffic, number of trains per day, and train speed at grade crossings.
State	
Washington State Department of Transportation, Design Manual M 22.01.10, November 2015, Chapter 1350, Railroad Grade Crossings	Sets forth requirements and guidance on the design and treatment of state highway-rail grade crossings.
Motor Vehicles, Rules of the Road (RCW 46.61.340)	Sets forth train traffic has the right-of-way at grade crossings.
Washington Utilities and Transportation Commission	Inspects and issues violations for hazardous materials shipments; track, signal, and train control; and rail operations. WUTC also regulates the construction, closure, or modification of public railroad crossings. In addition, WUTC inspects and issues defect notices if a crossing does not meet minimum standards. However, WUTC has no jurisdiction over public crossings in first-class cities.[a]

Regulation, Statute, Guideline	Description
Local	
Longview Municipal Code 11.40.080 (Railroad Trains Not to Block Streets)	Prohibits trains from using any street or highway for a period of time longer than 5 minutes, except trains or cars in motion other than those engaged in switching activities.

Notes:
[a] Per RCW 35.01.01, a first-class city is a city with a population of 10,000 or more at the time of organization or reorganization with an adopted charter.
FRA = Federal Railroad Administration; FHWA = Federal Highway Administration; USC = United States Code; RCW = Revised Code of Washington; WUTC = Washington Utilities and Transportation Commission

6.3.2 Study Area

The study areas are the same for both the On-Site Alternative and Off-Site Alternative. The study area for direct impacts is the project area. The study area for indirect impacts is defined as the arterials and secondary roads in the vicinity of the Longview industrial area along the Columbia River between the project area and Interstate 5. This includes the following active public and private at-grade crossings of the Reynolds Lead and BNSF Spur (Figure 6.3-1):

- Project area access at 38th Avenue, south of Industrial Way (State Route [SR] 432)
- Weyerhaeuser access at Washington Way, south of Industrial Way
- Weyerhaeuser North Pacific Paper Corporation (NORPAC) access, south of Industrial Way
- Industrial Way, west of Oregon Way (SR 433)
- Oregon Way, north of the Industrial Way/Oregon Way intersection
- California Way, north of Industrial Way
- 3rd Avenue (SR 432), north of the 3rd Avenue/Industrial Way intersection
- Dike Road, south of Tennant Way

6.3.3 Methods

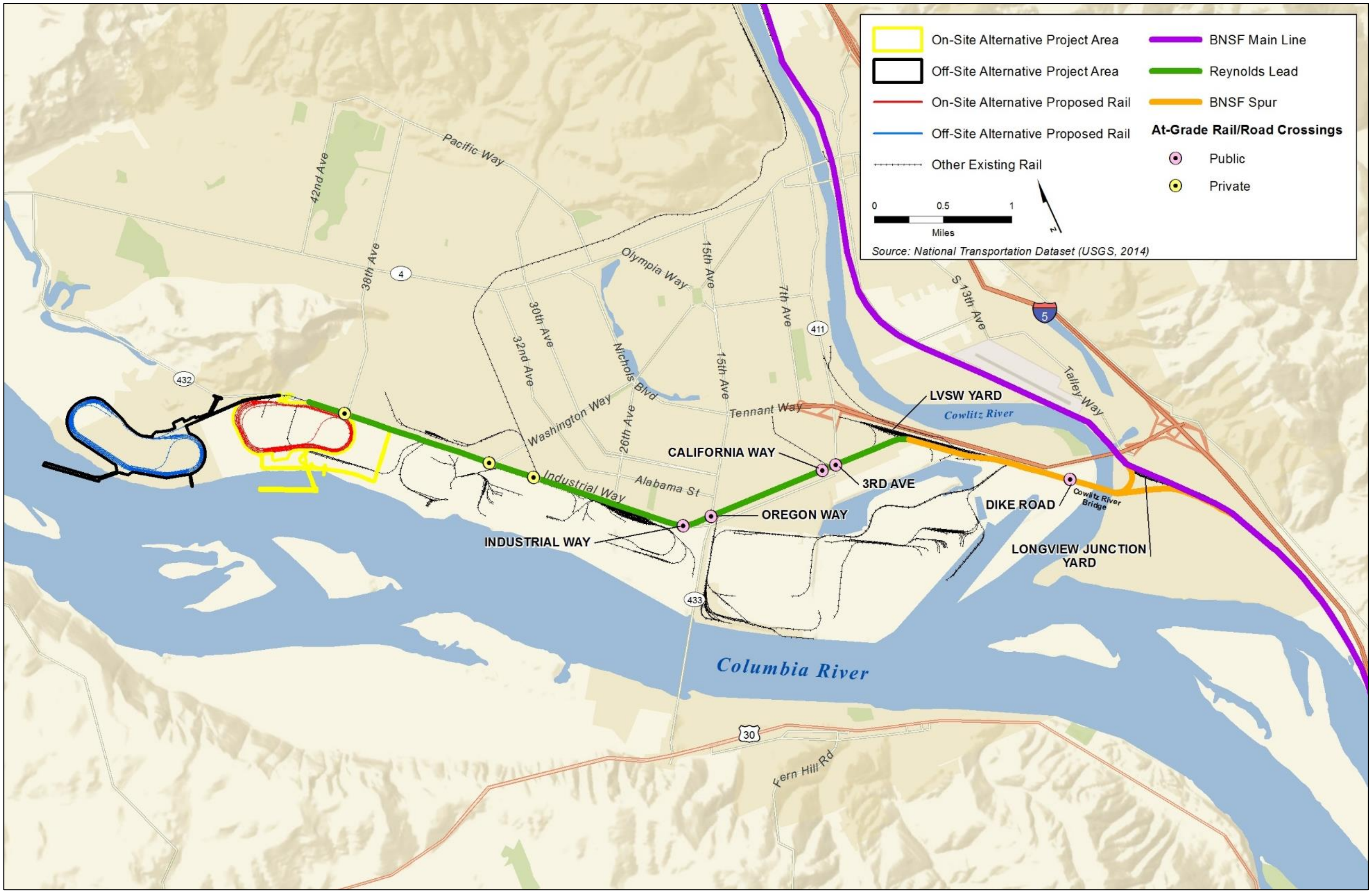
This section describes the sources of information and methods used to evaluate the potential impacts on vehicle transportation associated with the construction and operation of the proposed export terminal. For additional information, see the *NEPA Vehicle Transportation Technical Report* (ICF International and DKS Associates 2016b).

6.3.3.1 Information Sources

The following sources of information were used to identify potential impacts of the proposed export terminal on vehicle transportation in the study areas.

- Data provided by the Washington Utilities and Transportation Commission (WUTC)
- U.S. Department of Transportation (USDOT) Grade Crossing Inventory, Federal Railroad Administration (FRA)
- *SR 432 Highway Improvements and Rail Realignment Study* (Cowlitz-Wahkiakum Council of Governments 2014)
- Traffic volume data provided in local studies
- Data and information provided by the Applicant

Figure 6.3-1. Reynolds Lead and BNSF Spur Study Crossings



6.3.3.2 Impact Analysis

This section describes the methods used to evaluate the potential impacts on vehicle transportation associated with the construction and operation of the proposed export terminal.

The potential vehicle impacts addressed in this analysis include changes in average vehicle delay in a 24-hour period (average vehicle delay), changes in peak hour vehicle delay, changes in vehicle queuing, and changes to vehicle safety. Unlike passenger trains, freight trains do not run on a schedule. Railroad companies evaluate each situation and dispatch trains based on a number of criteria, including available crew, number of cars, cost of fuel, and overall revenue. Analysis and projection of rail impact operations requires analyzing the rail traffic and identifying typical operations. Because freight trains do not operate on a schedule, the 24-hour average vehicle delay was analyzed to represent the typical delay for drivers in the study area. The potential increase in vehicle delay during the PM (afternoon) peak hour was also analyzed to identify the highest anticipated vehicle delay impacts.

Analysis Scenarios

The following scenarios were analyzed.

- **2018 No-Action**. This scenario represents conditions in 2018 without construction of the terminal. This scenario includes activities currently ongoing and planned for the existing bulk product terminal within the Applicant's leased area, as described in Chapter 3, *Alternatives*.
- **2018 Export Terminal Construction**. This scenario represents the construction year for the export terminal with the most construction vehicle traffic. It assumes the motor vehicle and train volumes from the 2018 No-Action scenario, but with the added traffic and rail growth related to construction of the terminal. It also assumes the planned project area activities included in the 2018 No-Action scenario. This scenario considers two alternative assumptions: construction materials would be delivered by truck (Truck Delivery), and construction materials would be delivered by rail (Rail Delivery), as described in this section.
- **2028 No-Action**. This scenario represents conditions without the export terminal in 2028. It includes the motor vehicle and train volumes from the 2018 No-Action scenario, but with added growth to represent estimated 2028 traffic conditions. It also assumes some expansion of the existing bulk product terminal activities.
- **2028 Export Terminal**. This scenario represents conditions during full operation of the export terminal in 2028. It includes the motor vehicle and train volumes from the 2028 No-Action scenario, but with the added traffic and train growth related to full operation of the terminal. It also assumes the planned and potential expansion of the existing bulk product terminal activities included in the 2028 No-Action scenario. This scenario also considers the potential effect of track improvements along the Reynolds Lead and BNSF Spur.

The *SR 432 Highway Improvements and Rail Realignment Study* completed in September 2014 (Cowlitz-Wahkiakum Council of Governments 2014) developed various design concepts for rail and highway improvements to improve safety, mobility, congestion, and freight capacity. The top concept from this study was a grade-separated intersection at Industrial Way (SR 432)/Oregon Way (SR 433). This project, called the Industrial Way/Oregon Way Intersection Project and led by Cowlitz County Public Works, is currently in the preliminary design and National Environmental

Policy Act (NEPA) and Washington State Environmental Policy Act (SEPA) environmental compliance phase to address traffic congestion, freight mobility, and safety issues at this intersection. At-grade and grade-separated options are being evaluated. The 2015 transportation package passed by the Washington State Senate includes $85 million to construct the preferred alternative identified after the conclusion of the NEPA and SEPA processes. This project was not included in the vehicle transportation analysis because a preferred alternative for the intersection has not been identified. The other concepts identified in the *SR 432 Highway Improvements and Rail Realignment Study* were not included in the vehicle transportation analysis for the proposed export terminal because funding for implementation has not been secured.

Construction Impact Analysis

The Applicant has identified three construction-material-delivery scenarios: delivery by truck, rail, or barge.

- **Truck.** If material is delivered by truck, it is assumed approximately 88,000 truck trips would be required over the construction period. Approximately 56,000 loaded trucks would be needed during the peak construction year.
- **Rail.** If material is delivered by rail, it is assumed approximately 35,000 loaded rail cars would be required over the construction period. Approximately two-thirds of the rail trips would occur during the peak construction year.
- **Barge.** If material is delivered by barge, it is assumed approximately 1,130 barge trips would be required over the construction period. Approximately two-thirds of the barge trips would occur during the peak construction year. Because the project area does not have an existing barge dock, the material would be off-loaded at an existing dock elsewhere on the Columbia River and transported to the project area by truck.

For the vehicle transportation analysis, the barge scenario is functionally the same as the truck scenario because materials would be transferred from barge to truck and delivered to the project area by truck.

The analysis of potential vehicle transportation impacts during the peak construction year is based primarily on information provided by the Applicant, as documented in the *NEPA Vehicle Transportation Technical Report*, including the following.

- The amount of construction material delivered to the project area via truck or rail (applicable to all three construction material delivery scenarios).
- Daily and peak hour estimates of construction truck traffic to deliver materials (applicable to the truck delivery and barge delivery construction material delivery scenarios).
- Average number of daily construction trains (rail delivery construction material delivery scenario).
- Daily and peak hour construction worker vehicle traffic (applicable to all three construction material delivery scenarios).

Operations Impact Analysis

Full operations of the proposed export terminal (up to 44 million metric tons of coal per year) would add 16 new daily train trips (8 loaded and 8 empty trains), each an average of 6,844 feet long (approximately 1.3 miles).

Trip Generation and Trip Distribution

Based primarily on estimates provided by the Applicant, approximately 135 employees would be needed to operate the terminal.

Construction and operations traffic generated by the terminal was distributed onto the transportation network based on current traffic patterns in the study area. For the construction materials delivered to the project area by truck, it is assumed 75% of the trucks would arrive from the east using 3rd Avenue, and 25% from the south along Oregon Way. For the construction workers and terminal employees, it is assumed 60% of the traffic would arrive from the north using Washington Way (35%) and Oregon Way (25%), 15% from the south along Oregon Way, 20% from the east along 3rd Avenue, and 5% from the west along Industrial Way.

Baseline and Future Volumes

The following describes the baseline and future vehicular and train volumes.

Vehicles

Vehicle traffic count data were obtained from recent studies for the study crossings. Where recent traffic count data were unavailable, average daily traffic volumes were obtained from the FRA or WUTC databases and estimated PM peak hour traffic volumes were derived from the average daily traffic volumes. Hourly traffic volumes over 3 days were compared at select locations to identify a peak hour, which was identified as 4:00 p.m. to 5:00 p.m. The data also indicated the PM peak hour (hereafter referred to as peak hour) represents approximately 10% of the daily traffic volume. This factor was used to convert count data from peak hour to average daily traffic or vice versa.

Traffic volumes in 2018 and 2028 included a combination of background traffic, as well as growth associated with the proposed terminal. Year 2028 background traffic was estimated by developing a linear growth rate between existing and forecast traffic volumes in the immediate area. These data suggest traffic volumes will increase 2% annually. For comparison purposes, a 2% annual growth rate was applied to expand older count data to reflect baseline traffic conditions in the *SR 432 Highway Improvements and Rail Realignment Study* completed in September 2014 (Cowlitz-Wahkiakum Council of Governments 2014). Therefore, the 2% annual growth rate was applied to the collected count data to develop 2018 No-Action scenario traffic volumes, and to the 2018 No-Action scenario traffic volumes for 10 years to develop 2028 No-Action scenario traffic volumes. Table 6.3-2 illustrates the average daily traffic and peak hour count data for all study crossings.

Table 6.3-2. Motor Vehicle and Train Volumes at Study Crossings by Scenario

Crossing Name (USDOT Crossing ID)	Time Period	2018 No-Action Scenario		2018 Export Terminal Construction (Truck Delivery) Scenario		2018 Export Terminal Construction (Rail Delivery) Scenario		2028 No-Action Scenario		2028 Export Terminal Scenario	
		Vehicle	Train	Vehicle	Train	Vehicle	Train	Vehicle	Train	Vehicle	Train
Project area access at 38th Avenue	Per Day	200	2.3	2,850	2.3	2,000	3.6	250	4.0	1,340	20.0
	Peak Hour	20	1	285	1	200	1	25	1	134	1 or 2
Weyerhaeuser access at Washington Way	Per Day	3,300	2.3	3,300	2.3	3,300	3.6	3,900	4.0	3,900	20.0
	Peak Hour	330	1	330	1	330	1	390	1	390	1 or 2
Weyerhaeuser NORPAC access	Per Day	650	2.3	650	2.3	650	3.6	800	4.0	800	20.0
	Peak Hour	65	1	65	1	65	1	80	1	80	1 or 2
Industrial Way-SR 432 (101806G)	Per Day	10,100	2.3	12,000	2.3	11,200	3.6	11,450	4.0	12,100	20.0
	Peak Hour	1,010	1	1,200	1	1,120	1	1,145	1	1,210	1 or 2
Oregon Way-SR 433 (101805A)	Per Day	15,200	2.3	15,650	2.3	15,650	3.6	18,500	4.0	18,770	20.0
	Peak Hour	1,520	1	1,565	1	1,565	1	1,850	1	1,877	1 or 2
California Way (101821J)	Per Day	4,050	2.3	4,050	2.3	4,050	3.6	4,800	4.0	4,800	20.0
	Peak Hour	405	1	405	1	405	1	480	1	480	1 or 2
3rd Avenue-SR 432 (101826T)	Per Day	16,850	2.3	17,850	2.3	17,200	3.6	20,500	4.0	20,720	20.0
	Peak Hour	1,685	1	1,785	1	1,720	1	2,050	1	2,072	1 or 2
Dike Road (101791U)	Per Day	950	7.1	950	7.1	950	8.4	1,100	7.1	1,100	23.1
	Peak Hour	95	1	95	1	95	1	110	1	110	1 or 2

Notes:
USDOT = U.S. Department of Transportation

Trains

Section 6.1, *Rail Transportation*, describes methods to estimate the types, numbers, and speed of trains between the project area and Longview Junction in 2018 and 2028. As described in Section 6.1, *Rail Transportation*, Longview Switching Company (LVSW) plans to upgrade the Reynolds Lead and BNSF Spur as a separate action should it be warranted by increased rail traffic from current and future customers. Upgrades would include replacing ballast, ties, and rails to provide safer operation and allow increased train speed. LVSW would also install signals and upgrade traffic control and switching systems to increase capacity. Because these improvements are not certain, the vehicle transportation impact analysis analyzes both current track infrastructure and with planned track improvements.

Table 6.3-2 illustrates the assumed number of trains for each scenario in 2018 and 2028. In summary, Table 6.3-2 shows the following.

- The 2018 Export Terminal Construction (Rail Delivery) scenario would add an average of 1.3 train trips per day during the peak construction year at study crossings on the Reynolds Lead and BNSF Spur. It was assumed 1 project-related train could travel during the peak hour. The 2018 Construction (Truck Delivery) scenario would not add any trains to the Reynolds Lead or BNSF Spur.
- The 2028 Export Terminal scenario would add 16 trains per day to the Reynolds Lead and BNSF Spur. It was assumed 1 project-related train could travel during the peak hour with current track infrastructure on the Reynolds Lead and BNSF Spur, and up to 2 project-related trains could travel during the peak hour with planned track infrastructure on the Reynolds Lead and BNSF Spur.

Railroad Crossing Performance Measures

The following performance measures were used to determine adverse impacts and are defined below.

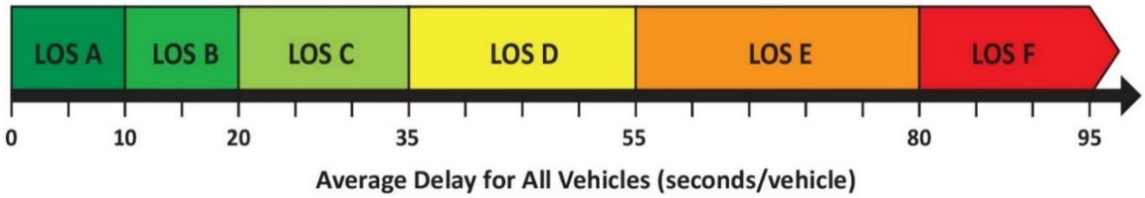
- **Level of service:** A study crossing that would operate below level of service D that would not otherwise operate below level of service D under the No-Action scenario for the same year.
- **Vehicle Queuing:** An estimated queue length that would extend from a study crossing that exceeds available storage length (to an adjacent intersection) that would not otherwise exceed the available storage length under the No-Action scenario for the same year.
- **Vehicle safety:** A study crossing with a predicted accident probability above 0.04 accident per year with the proposed export terminal but at or below 0.04 accident per year under the No-Action scenario for the same year.

The following section provides additional information on the performance measures.

Level of Service

Level of service represents a “report card” rating (A through F) based on the delay experienced by vehicles at an intersection, or in this case, a railroad crossing, as shown in Figure 6.3-2. Levels of service A, B, and C indicate conditions where traffic moves without substantial delay. Levels of service D and E represent progressively worse operating conditions. Level of service F represents conditions where average vehicle delay has become excessive and demand has exceeded capacity.

Figure 6.3-2. Level of Service



According to Washington State Department of Transportation (WSDOT) level of service standards (2010), level of service D or better is acceptable for urban highways. The transportation element of the *City of Longview Comprehensive Plan* (December 2006) defines a capacity deficiency on arterial segments as a volume-to-capacity ratio of 0.85 or higher (representing a generalized level of service of D or worse). As a conservative approach, level of service D (average delay for all vehicles equal to or less than 55 seconds) was applied as a standard at all study crossings, regardless of the street functional classification or jurisdiction. An adverse level of service impact was defined as a study crossing that operates below level of service D with the proposed export terminal when it would not otherwise operate below level of service D under the No-Action scenario for the same year.

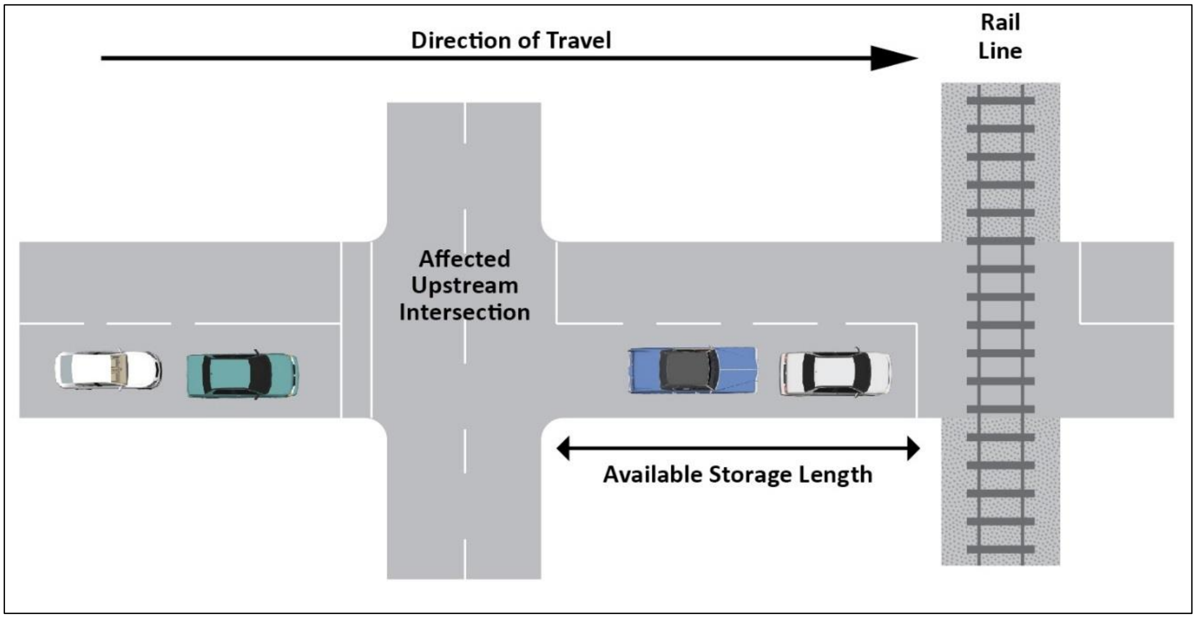
For the 24-hour vehicle delay analysis, the traffic operating conditions at the study crossings were determined based on the *2000 Highway Capacity Manual* (Transportation Research Board 2000) methods for signalized intersections (the at-grade railroad crossings were assumed to be pre-timed traffic signals). The average delay per vehicle in a 24-hour period (in seconds) for a rail crossing was determined based on the average number of daily trains, average train length, train speed, and average daily traffic volumes in both directions. This average vehicle delay in seconds per vehicle was then converted to the applicable level of service designation (Figure 6.3-2) for comparison with the No-Action scenario.

The same methods were used for the peak hour analysis. The average vehicle delay in the peak hour (in seconds) for a rail crossing was determined based on the peak hour number of trains, average train length, train speed, and peak hour traffic volume in both directions. This average vehicle delay in seconds per vehicle was then converted to the applicable level of service designation (Figure 6.3-2) for comparison with the No-Action scenario.

Vehicle Queuing

Each study grade crossing has a storage length to store vehicles when the crossing is blocked. The available storage length is the distance between the crossing and the next intersection (upstream intersection), as shown in Figure 6.3-3. As vehicles queue, the distance vehicles extend back from the crossing while waiting at a blocked crossing increases.

Figure 6.3-3. Vehicle Queuing



Queuing analysis was conducted using SimTraffic™ 8, which estimates the 95th percentile vehicle queue lengths, or the queue length not be exceeded in 95% of the queues formed during the peak hour.

An adverse vehicle queuing impact was defined as a queue from a study crossing exceeding the available storage length (to an adjacent intersection) with the proposed export terminal that would not otherwise exceed the available storage under the No-Action scenario from the same year.

Vehicle Safety

An accident probability analysis was conducted for the study crossings using the FRA GradeDec.Net web-based software, which estimates the predicted annual accident probability at a crossing in a year. The probability uses USDOT's Accident Prediction and Severity model. This model estimates accident probability based on numerous grade crossing features available in FRA's nationwide inventory of at-grade crossings, including the type of crossing protection in place, historical accident data at the crossing, vehicle traffic volumes, the number of roadway lanes and train tracks, the number of trains per day, and train speed. Other physical factors affecting the probability of collisions at a crossing, such as available sight distance, are not direct inputs in this model. However, the accident history at these crossings would likely reflect these characteristics, and such characteristics would not be affected by the proposed export terminal, which would only alter the number of trains per day and vehicle traffic volumes (at some grade crossings). This analysis provides a frame of reference for crossings by estimating accident probability, but does not identify these crossings as unsafe.

Based on other applications of the model, an adverse vehicle safety impact was defined as a study crossing with a predicted accident probability above 0.04 accident per year with the proposed export terminal that would be at or below 0.04 accident per year under the No-Action scenario.

6.3.4 Affected Environment

This section describes the affected environment in the study areas related to vehicle transportation potentially affected by the construction and operation of the proposed export terminal.

6.3.4.1 Study Crossing Characteristics

Table 6.3-3 provides vehicle and train traffic information at the study crossings on the Reynolds Lead and BNSF Spur. Roadway characteristics are also listed, including roadway functional classifications and number of lanes at the crossing. The following describes vehicle safety at study crossings and emergency service providers.

Table 6.3-3. Study Crossing Characteristics

Crossing Name (USDOT Crossing ID)	Roadway			Railroad (Trains)		
	Estimated AADT	Functional Classification[a]	Lanes	Protection[b]	Crossings per Day	Average Speed (mph)[c]
Project area access at 38th Avenue	200	Private	2	None	2.3	5 (freight)
Weyerhaeuser access at Washington Way	3,300	Private	4	None	2.3	8 (freight)
Weyerhaeuser NORPAC access	650	Private	2	None	2.3	10 (freight)
Industrial Way-SR 432 (101806G)	10,100	Principal Arterial	2	Overhead Lights	2.3	10 (freight)
Oregon Way- SR 433 (101805A)	15,200	Principal Arterial	4	Gates/ Overhead Lights	2.3	10 (freight)
California Way (101821J)	4,050	Minor Arterial	2	Overhead Lights	2.3	8 (freight)
3rd Avenue- SR 432 (101826T)	16,850	Principal Arterial	4	Gates/ Overhead Lights	2.3	8 (freight)
Dike Road (101791U)	950	Local	2	Overhead Lights	7.1	10 (freight)

Notes:
[a] Source: City of Longview 2015.
[b] Source: Field observations.
[c] Source: ICF International and Hellerworx 2016c.
USDOT = U.S. Department of Transportation; AADT = annual average daily traffic; mph = miles per hour

Vehicle Safety

Ten years of collision records (2003 to 2013) for the at-grade railroad crossings along the Reynolds Lead and BNSF Spur were obtained from FRA and WSDOT databases. The data identified one vehicle collision involving a train in the study area—at the Washington Way crossing, just south of the

Industrial Way intersection. The crossing is ungated and located less than 50 feet from Industrial Way. The collision involved a vehicle stopped at the traffic signal, beyond the stop bar and on the track, getting struck by a train. The collision resulted in property damage only.

Emergency Services

The Cowlitz 2 Fire & Rescue District, Longview Fire Department, and American Medical Response (AMR) provide emergency medical services and fire protection for the project areas. The service providers are briefly described below; additional information on the stations, facilities, and apparatus of each is provided in the *NEPA Social and Community Resources Technical Report* (ICF International and BergerABAM 2016a).

Cowlitz 2 Fire & Rescue provides fire protection services, and serves approximately 34,000 citizens in the City of Kelso and unincorporated Cowlitz County, responding to approximately 4,100 calls per year (Cowlitz 2 Fire & Rescue 2015). The district is staffed by approximately 120 full-time and volunteer members in five active fire stations, two of which are staffed with full-time EMT and paramedic firefighters. Volunteer firefighter EMTs also respond on an on-call basis. Figure 6.3-4 illustrates the fire stations in the Longview-Kelso area.

The Longview Fire Department serves approximately 36,000 citizens spread over 14.7 square miles of urban and suburban development. The department is staffed with 39 full-time EMT/firefighters, and 4 paramedic/firefighters. Paramedic transport service is provided within the city by AMR, a private provider. The Longview Fire Department responds to approximately 4,500 calls per year from two fire stations (City of Longview 2015).

AMR is a private ambulance company providing emergency and nonemergency medical transport service. AMR includes approximately 35 paramedics and EMTs, and handles an average of 7,500 calls annually (American Medical Response 2015). The medical transport vehicles are based out of the facility near the Cowlitz Way intersection with Long Avenue.

6.3.5 Impacts

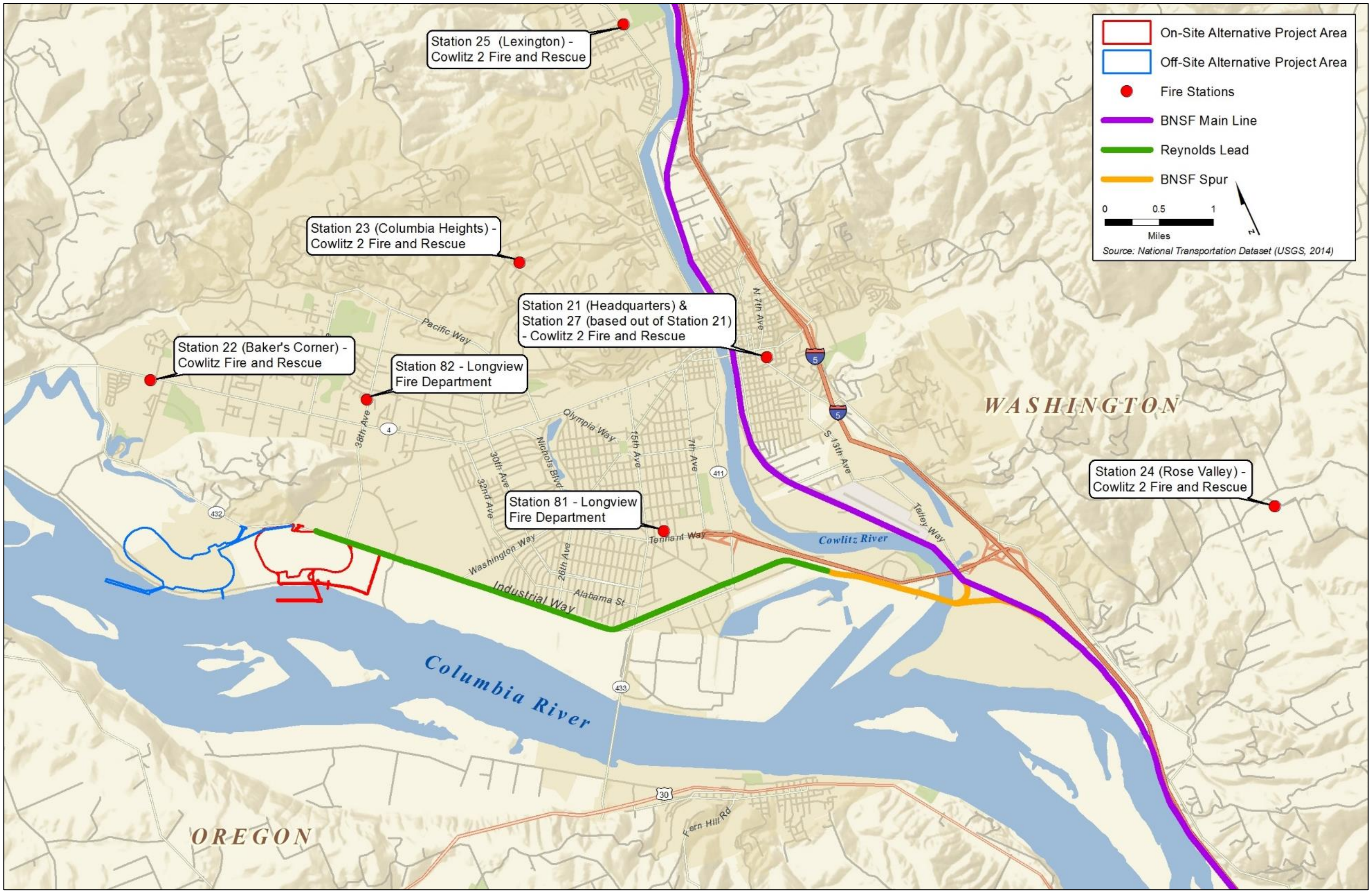
This section describes the potential direct and indirect impacts related to vehicle transportation from construction and operation of the proposed export terminal. For more detailed information, see the *NEPA Vehicle Transportation Technical Report*.

6.3.5.1 On-Site Alternative

Construction—Direct Impacts

Vehicle transportation in the project area during construction would not have a direct impact on vehicle transportation outside the project area. An estimated 1,800 motor vehicle trips per day are estimated as a result of peak construction activities with the rail delivery scenario, or an estimated 2,650 motor vehicle trips per day with the truck delivery scenario. These vehicles would access the project area via the private driveway opposite 38th Avenue or a new driveway on Industrial Way. Parking would be provided for construction workers in the Applicant's leased area.

Figure 6.3-4. Fire Stations in the Kelso-Longview Area



Construction—Indirect Impacts

The rail delivery scenario would add an average of 1.3 train trips per day during the peak construction year in 2018. One project-related construction train would take between 8 and 9 minutes to pass through each at-grade crossing along the Reynolds Lead and BNSF Spur.

Vehicle Delay

24-Hour Average Vehicle Delay

All study crossings would operate at level of service A in 2018, indicating a low impact on average daily vehicle delay from project-related construction trains at the at-grade crossings on the Reynolds Lead and BNSF Spur. As shown in Table 6.3-4, the estimated average delay for all vehicles in a 24-hour period would be up to 10 seconds at the study crossings with the truck delivery and rail delivery scenarios. The transport of construction materials by truck and rail would not have an adverse impact on average vehicle delay at the study crossings along the Reynolds Lead and BNSF Spur because all study crossings would continue to operate at level of service A.

Peak Hour Vehicle Delay

Over a 24-hour period, vehicle delay from a project-related construction train would be highest during the peak hour. This analysis evaluates the potential impacts if a project-related construction train travels over the BNSF Spur and Reynolds Lead during the peak hour as a potential worst-case analysis for vehicle delay during construction. For the rail delivery scenario, the probability that a construction train would travel during the peak hour is approximately 5% each day. Thus, it is unlikely a project-related construction train would travel through study crossings during the peak hour on a given day. Vehicle delay at study crossings would be lower than presented in this subsection if a project-related construction train travels outside of the peak hour (during the other 23 hours of the day). The analysis in the previous subsection represents the 24-hour average vehicle delay for all drivers and is therefore more representative of overall vehicle delay at the study crossings in 2018.

Table 6.3-5 illustrates the estimated peak hour vehicle delay at the study crossings on the Reynolds Lead and BNSF Spur by scenario in 2018.

Under the truck delivery scenario, all study intersections would operate at level of service A, B, or C, and, therefore, the truck delivery scenario would not have an adverse impact on vehicle delay at the study crossings. If a project-related construction train travels during the peak hour, two public study crossings (California Way and 3rd Avenue) and one private study crossing (project area access at 38th Avenue) would operate below level of service D (standard used for the analysis), meaning the average delay at these crossings during the peak hour would be more than 55 seconds. Project-related construction trains would have an adverse impact at these three study crossings if a project-related construction train travels during the peak hour.

Table 6.3-4. Estimated 24-Hour Average Level of Service at Reynolds Lead and BNSF Spur Study Crossings in 2018 by Scenario

		On-Site Alternative Construction	
Crossing	No-Action Scenario	Truck Delivery Scenario	Rail Delivery Scenario[a]
Project Area Access at 38th Avenue	A	A	A
Weyerhaeuser Access at Washington Way	A	A	A
Weyerhaeuser NORPAC Access	A	A	A
Industrial Way	A	A	A
Oregon Way	A	A	A
California Way	A	A	A
3rd Avenue	A	A	A
Dike Road	A	C	A

Notes:

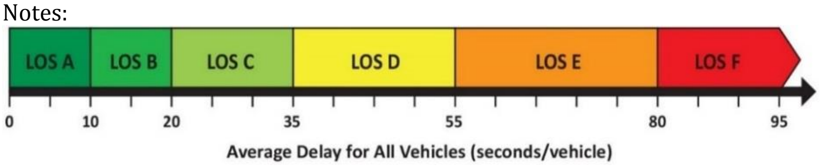
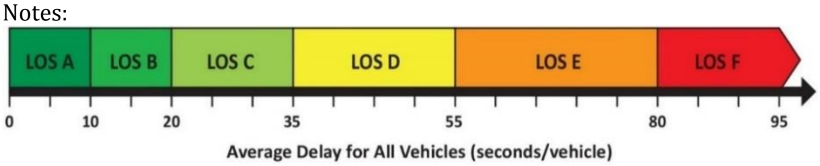


Table 6.3-5. Estimated Peak Hour Level of Service at Reynolds Lead and BNSF Spur Study Crossings in 2018 by Scenario

		On-Site Alternative Construction	
Crossing	No-Action Scenario	Truck Delivery Scenario	Rail Delivery Scenario[a]
Project Area Access at 38th Avenue	B	B	**F**
Weyerhaeuser Access at Washington Way	A	A	D
Weyerhaeuser NORPAC Access	A	A	C
Industrial Way	A	A	D
Oregon Way	A	A	D
California Way	A	A	**E**
3rd Avenue	B	B	**E**
Dike Road	C	C	C

Notes:



[a] The On-Site Alternative would result in this level of service only if a project-related construction train travels during the peak hour. **Bolded, shaded gray** values indicate an adverse level of service impact (a study crossing that operates below level of service D under the On-Site Alternative that would not otherwise operate below level of service D under the No-Action scenario for the same year).

Queuing

Increased vehicle delay from trains blocking at-grade crossings can affect nearby intersections. As vehicles begin to queue while waiting for the crossing to reopen, increased roadway congestion can affect upstream intersections. Over a 24-hour period, queue lengths would be highest if a project-related construction train travels during the peak hour. This queuing analysis evaluates the potential impacts if a project-related construction train travels during the peak hour as a potential worst-case analysis for queue lengths during construction. For the rail delivery scenario, the probability that a construction train would travel during the peak hour is an average of approximately 5% each day, and it is unlikely a project-related construction train would travel during the peak hour every day. Queue lengths at study crossings would be lower than presented in this subsection if project-related trains travel outside of the peak hour (during the other 23 hours of the day).

Table 6.3-6 illustrates estimated 2018 queue lengths if a project-related construction train travels during the peak hour. Table 6.3-6 also illustrates the estimated queue length under the No-Action scenario for comparison.

Two queue lengths under the 2018 Proposed Export Terminal Construction (Rail Delivery) scenario would exceed the available storage length that would not be exceeded under the No-Action scenario.

- Vehicles traveling to Weyerhaeuser on Washington Way would queue on Washington Way at the Washington Way/Industrial Way intersection if a project-related construction train travels during the peak hour. Because the queue would block the left-turn lane to Industrial Way and would not occur under the No-Action scenario, a project-related construction train would have an adverse impact on this queue.
- Vehicles traveling southbound on Oregon Way would queue on Oregon Way at the Reynolds Lead crossing of Oregon Way if a project-related construction train travels during the peak hour. Because the queue length on Oregon Way would exceed the available storage length (extend to Alabama Street) and would not be exceeded under the No-Action scenario, a project-related construction train would have an adverse impact on this queue.

These adverse queue impacts would only occur if a construction train travels during the peak hour (an average probability of approximately 5% each day).

Emergency Vehicle Response

The vehicle delay analysis in the previous subsection illustrates how the average vehicle delay for all vehicles, including emergency vehicles, would change with project-related construction trains. Average vehicle delay would increase under the rail delivery scenario because trains transporting construction materials would operate on the Reynolds Lead and BNSF Spur. Total gate downtime is estimated to be up to 12 minutes longer per day than the No-Action scenario at public crossings along the Reynolds Lead and BNSF Spur. In a 24-hour period, construction trains would increase the probability of an emergency response vehicle being delayed by 1% at all study crossings along the Reynolds Lead and BNSF Spur.

Table 6.3-6. Estimated 2018 Peak Hour Vehicle Queue Lengths by Scenario[a]

Crossing Name	Road Movement[b]	2018 No-Action	2018 Truck	2018 Rail	Intersection Affected by Queue from Crossing	Intersection Movement[c]	2018 No-Action	2018 Truck	2018 Rail
		Estimated Crossing Queue Length (feet)					Estimated Intersection Queue Length (feet)		
Project Area Access at 38th Avenue	NB	40	1,960	2,480	Industrial Way/ 38th Avenue	WBL	20	20	20
	SB	20	20	20		EBR	20	20	20
Weyerhaeuser Access at Washington Way	NB	140	160	460	Industrial Way/ Washington Way	WBL	120	120	140
						EBR	40	40	40
	SB	120	120	160		SBT	60	60	160
Weyerhaeuser NORPAC Access	NB	60	60	140	Industrial Way/ NORPAC Access	WBL	20	20	20
	SB	20	20	20		EBR	20	20	20
Industrial Way	NB	360	360	420	Industrial Way/ Weyerhaeuser	EBL	140	140	240
	SB	280	360	1,220		NBT	240	240	300
Oregon Way	NB	660	640	2,460	Industrial Way/ Oregon Way	NBT	440	420	2,240
						EBL	180	240	240
						WBR	100	100	100
	SB	200	220	960	Oregon Way/ Alabama Street	EBR	N/A	N/A	120
						WBL			100
						SBT			260
California Way	NB	100	100	260	Industrial Way/ California Way	N/A	N/A	N/A	N/A
	SB	120	140	600					
3rd Avenue	NB	1,040	1,060	1,640	3rd Avenue/ Industrial Way	WBR	60	60	80
						NBT	640	660	1,240
					Industrial Way/ California Way	SBL	120	120	140
	SB	240	280	1,240		NBR	60	60	60
						EBT	400	420	1,000

Crossing Name	Road Movement[b]	2018 No-Action	2018 Truck	2018 Rail	Intersection Affected by Queue from Crossing	Intersection Movement[c]	2018 No-Action	2018 Truck	2018 Rail
		Estimated Crossing Queue Length (feet)					Estimated Intersection Queue Length (feet)		
Dike Road	NB	60	60	100	None	N/A	N/A	N/A	N/A
	SB	100	100	120					

Notes:

[a] Shaded gray values indicate a study crossing or intersection queue that exceeds available storage for the scenario. Shaded black values indicate an adverse queuing impact.

[b] Roadway movement approaching the rail crossing; NB = northbound; SB = southbound; EB = eastbound; WB = westbound

[c] Movement at nearby intersection affected by queue from rail crossing; NBL = northbound left; NBR = northbound right; NBT = northbound through; SBL = southbound left; SBR = southbound right; SBT = southbound through; EBL= eastbound left; EBR= eastbound right; EBT= eastbound through; WBL= westbound left; WBR= westbound right; WBT= westbound through

The impact on emergency vehicle response would depend on the location of the origin and destination of the response incident in relation to the at-grade crossings along the Reynolds Lead and BNSF Spur. The potential for a project-related construction train to affect emergency response would also depend on whether the dispatched emergency vehicle would need to cross the rail line and the availability of alternative routes if a project-related construction train occupies the crossings at the time of the call.

Predicted Accident Probability

An accident probability analysis was conducted using the FRA GradeDec.Net web-based software. GradeDec.Net contains a predicted accident probability module based on the USDOT accident prediction and severity formula. The accident probability analysis found none of the study crossings would have a predicted accident probability above 0.04 accident per year (the benchmark used for the analysis) with project-related construction trains (Table 6.3-7).

Table 6.3-7. 2018 Predicted Accident Probability

	Predicted Accidents (accidents/year)		
		On-Site Alternative Construction	
Crossing	No-Action Scenario	Truck Delivery Scenario	Rail Delivery Scenario
Project Area Access at 38th Avenue	0.008	0.019	0.020
Weyerhaeuser Access at Washington Way	0.014	0.014	0.017
Weyerhaeuser NORPAC Access	0.012	0.012	0.015
Industrial Way	0.013	0.014	0.016
Oregon Way	0.018	0.018	0.021
California Way	0.010	0.010	0.012
3rd Avenue	0.021	0.021	0.025
Dike Road	0.014	0.014	0.014

Operations—Direct Impacts

Vehicle transportation in the project area during operations would not have an adverse impact on vehicle transportation outside the project area. Approximately 135 employees would operate the export terminal in 2028. Operations would occur 24 hours per day, 7 days per week. All vehicles would access the project area via the private driveway opposite 38th Avenue or at the existing driveway on Industrial Way approximately 0.5 mile west of the 38th Avenue driveway. Access roads in the project area would be designed to allow two-way traffic for standard vehicles. All roadways and parking areas would be designed and constructed to the standards appropriate for loading and capacity requirements. All regularly used roads accessing the buildings and facilities in the project area would be sealed with asphalt pavement. Paving would be designed to accommodate mobile equipment loadings. Surfacing of unpaved areas would control soil erosion by wind and water.

Operations—Indirect Impacts

All vehicle transportation impacts during operations would occur outside the project area and, therefore, considered indirect impacts for this analysis. The On-Site Alternative would add 16 trains per day at study crossings along the Reynolds Lead and BNSF Spur. This section presents vehicle delay impacts with current and planned track infrastructure on the Reynolds Lead and BNSF Spur. Planned track infrastructure are estimated to increase the average train speed from:

- 8 miles per hour (mph) to 10 mph at the Weyerhaeuser access crossing opposite Washington Way
- 10 mph to 15 mph at the Weyerhaeuser NORPAC access crossing
- 10 mph to 20 mph at the Industrial Way and Oregon Way crossings
- 8 mph to 15 mph at the California Way and 3rd Avenue crossings.

Planned track infrastructure would not change average train speed at existing site access opposite 38th Avenue and Dike Road crossings. A project-related train would take between 8 and 10 minutes to pass through each public study crossing along the Reynolds Lead with current track infrastructure, and between 4 and 6 minutes with planned track infrastructure. Project-related trains would take about 8 minutes to cross Dike Road along the BNSF Spur. Overall, the 16 project-related trains daily would increase the total gate downtime by over 130 minutes during an average day for the public study crossings along the Reynolds Lead and BNSF Spur.

Vehicle Delay

24-Hour Average Vehicle Delay

The analysis concluded project-related trains would not have an adverse impact on daily average vehicle delay at the public at-grade crossings on the Reynolds Lead and BNSF Spur because average vehicle delay would not change substantially.

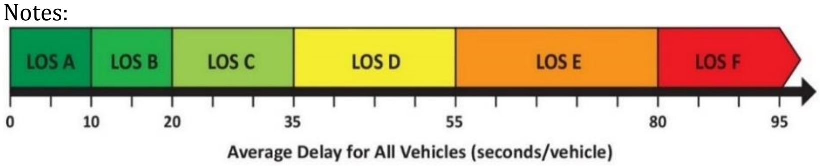
Table 6.3-8 shows the estimated level of service experienced over a 24-hour period at each study crossing along the Reynolds Lead and BNSF Spur in 2028 with current and planned track infrastructure. All public study crossings in 2028 would operate at or better than the standard used for the analysis (level of service D) with current and planned track infrastructure, meaning the average vehicle delay for all vehicles at the public study crossings would be up to 55 seconds. Therefore, project-related trains would not have an adverse impact on average vehicle delay in 2028 at the public study crossings along the Reynolds Lead and BNSF Spur.

One private crossing, the project area access at 38th Avenue, would operate at level of service F with current and planned track infrastructure (the average delay for all vehicles at this crossing would be more than 80 seconds). Project-related trains would have an adverse impact on vehicle delay at this crossing. This crossing currently provides and would continue to provide access to the Applicant’s leased area.

Table 6.3-8. Estimated 24-Hour Average Level of Service at Reynolds Lead and BNSF Lead Study Crossings in 2028 by Scenario[a]

Crossing	No-Action	On-Site Alternative	
		Current Track Infrastructure	Planned Track Infrastructure
Project Area Access at 38th Avenue	A	**F**	**F**
Weyerhaeuser Access at Washington Way	A	C	C
Weyerhaeuser NORPAC Access	A	C	B
Industrial Way	A	C	A
Oregon Way	A	C	A
California Way	A	D	B
3rd Avenue	A	D	B
Dike Road	A	C	C

Notes:



[a] **Bolded, shaded gray** values indicate an adverse impact (a study crossing that operates below level of service D under the On-Site Alternative that would not otherwise operate below level of service D under the No-Action scenario for the same year).

Peak Hour Vehicle Delay

Over a 24-hour period, vehicle delay would be highest during the peak hour. This analysis evaluates the potential impacts during the peak hour as a potential worst-case analysis for vehicle delay during operations. It is unlikely a project-related construction train would travel during the peak hour every day. Vehicle delay at study crossings would be lower than presented in this subsection if project-related trains travel outside of the peak hour (during the other 23 hours of the day). The analysis in the previous subsection represents the 24-hour average vehicle delay for all drivers and is therefore more representative of potential vehicle delay at the study crossings in 2028.

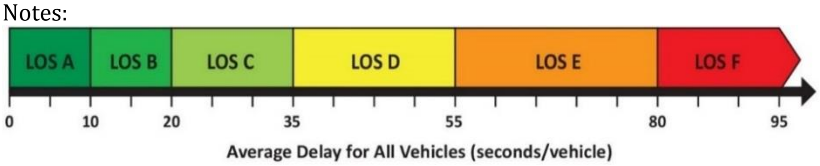
The analysis concluded project-related trains would not have an adverse impact on peak hour vehicle delay at the public at-grade crossings if track improvements are made to the Reynolds Lead and BNSF Spur and one project-related train travels during the peak hour. However, if two project-related trains travel during the peak hour, or infrastructure improvements are not made to the Reynolds Lead and BNSF Spur, vehicle delay would substantially change at selected public at-grade crossings along the Reynolds Lead and BNSF Spur during the peak hour. These vehicle delay impacts would be temporary (limited to the peak hour), and the probability for two trains to pass during the peak hour would be low, as described above. The following presents the results of the peak hour analysis in more detail.

Table 6.3-9 illustrates the estimated peak hour vehicle delay at the study crossings on the Reynolds Lead and BNSF Spur in 2028 by scenario. As shown, the project-related trains would increase average delay per vehicle during the peak hour, with forecasted level of service dropping below D, the standard used for the analysis, at six of the study crossings on the Reynolds Lead with existing track infrastructure.

Table 6.3-9. Estimated Peak Hour Level of Service at Reynolds Lead and BNSF Spur Study Crossings in 2028 by Scenario[a]

Crossing	No-Action	On-Site Alternative: Current Track Infrastructure: 1 Peak Hour Train	On-Site Alternative: Planned Track Infrastructure: 1 Peak Hour Train	On-Site Alternative: Planned Track Infrastructure: 2 Peak Hour Trains
Project Area Access at 38th Avenue	B	**F**	**F**	**F**
Weyerhaeuser Access at Washington Way	A	**E**	D	**E**
Weyerhaeuser NORPAC Access	A	D	B	C
Industrial Way (SR 432)	A	**E**	B	C
Oregon Way (SR 433)	A	**E**	B	C
California Way	A	**E**	C	D
3rd Avenue	B	**F**	C	**E**
Dike Road	C	D	D	**E**

Notes:



[a] The On-Site Alternative would result in this level of service only if a project-related train travels during the peak hour. **Bolded, shaded gray** values indicate an adverse vehicle delay impact (a study crossing that operates below level of service D under the On-Site Alternative that would not otherwise operate below level of service D under the No-Action scenario for the same year).

Table 6.3-9 illustrates the following.

- If no improvements are made to the Reynolds Lead to increase the average train speed from 10 mph to up to 25 mph and decrease gate downtime at the study crossings, the peak hour level of service would be below level of service D at six of the eight study crossings. This means the average delay for all vehicles at these crossings would be more than 55 seconds during the peak hour. Project-related trains would have an adverse impact at these six crossings only if a project-related train travels through the crossing during the peak hour.
- If improvements are made to the Reynolds Lead, and 1 project-related train travels during the peak hour, one study crossing (project area access at 38th Avenue) would operate below level of service D, meaning the average delay for all vehicles at this crossing would be more than 55 seconds during the peak hour. Project-related trains would only have an adverse impact at this crossing if a project-related train travels through during the peak hour.
- If improvements are made to the Reynolds Lead and 2 project-related trains travel during the peak hour, four of the eight study crossings would operate below level of service D, meaning the average delay for all vehicles at these crossings would be more than 55 seconds during the peak hour. Project-related trains would have an adverse impact at these four crossings only if 2 project-related trains travel through the crossing during the peak hour.

Queuing

Increased vehicle delay from trains blocking at-grade crossings can affect nearby intersections. As vehicles begin to queue while waiting for the crossing to open, increased roadway congestion can affect upstream intersections. Over a 24-hour period, queue lengths would be highest during the peak hour if a project-related train travels through the study crossings during the peak hour. This queuing analysis evaluates the potential impacts if a project-related train travels during the peak hour as a potential worst-case analysis for queue lengths during construction. It is unlikely a project-related train would travel during the peak hour each day. Queue lengths at study crossings would be lower than presented in this subsection if a project-related train does not travel during the peak hour.

Table 6.3-10 illustrates the estimated 2028 peak hour queue length if a project-related train travels during the peak hour. While project-related trains would increase queue lengths at study area crossings, queue lengths would already be exceeded at all of these crossings except the southbound movement at Oregon Way. Table 6.3-10 also illustrates estimated queue lengths with project-related trains would be shorter with planned improvements to the Reynolds Lead because these improvements would allow project-related trains to travel at higher speeds, which would decrease gate downtime at at-grade crossings.

Two queue lengths would exceed the available storage length that would not be exceeded under the 2028 No-Action scenario.

- Vehicles traveling to Weyerhaeuser on Washington Way would queue on Washington Way at the Industrial Way intersection if a project-related train passes during the peak hour. This queue with planned infrastructure to the Reynolds Lead would block the left-turn lane to Industrial Way. The turn lane would not be blocked under the 2028 No-Action scenario. Project-related trains would have an adverse queuing impact at this intersection.
- Vehicles traveling southbound on Oregon Way would queue on Oregon Way if a project-related train passes during the peak hour. The queue would exceed available storage length that would not be exceeded under the 2028 No-Action scenario. Project-related trains would have an adverse queuing impact at this crossing.

Emergency Vehicle Response

The vehicle delay analysis in the previous subsection illustrates how the average vehicle delay for all vehicles, including emergency vehicles, would be affected during operations in 2028. Average vehicle delay would increase with the addition of project-related trains because more trains would operate at study crossings. Because vehicle delay would increase for all vehicles, emergency vehicle delay would also increase if an emergency vehicle is blocked at a crossing occupied by a project-related train.

Table 6.3-10. Estimated Vehicle Queue Lengths—2028 Operations (Peak Hour)[a]

Crossing Name (USDOT Crossing ID)	Road Movement[b]	2028 No-Action	2028 Exist. Infras.	2028 Plan. Infras.	Intersection Affected by Queue from Crossing	Intersection Movement[c]	2028 No-Action	2028 Exist. Infras.	2028 Plan. Infras.
		Estimated Queue Length at Crossing (feet)					Estimated Queue Length at Intersection (feet)		
Project Area Access at 38th Avenue	NB	40	1,120	1,240	Industrial Way/ 38th Avenue	WBL	20	160	180
	SB	20	160	200		EBR	20	20	20
Weyerhaeuser Access at Washington Way	NB	280	760	480	Industrial Way/ Washington Way	WBL	120	180	140
						EBR	40	40	40
	SB	120	240	200		SBT	60	240	180
Weyerhaeuser NORPAC Access	NB	60	160	100	Industrial Way/ NORPAC Access	WBL	20	20	20
	SB	20	20	20		EBR	20	20	20
Industrial Way	NB	380	500	420	Industrial Way/ Weyerhaeuser	EBL	140	200	120
	SB	340	1,200	520		NBT	260	380	300
Oregon Way	NB	880	2,140	1,460	Industrial Way/ Oregon Way	NBT	660	1,920	1,220
						EBL	180	240	200
						WBR	100	100	100
	SB	440	1,580	800	Oregon Way/ Alabama Street	EBR	N/A	280	120
						WBL		560	100
						SBT		880	100
California Way	NB	100	240	180	Industrial Way/ California Way	N/A	N/A	N/A	N/A
	SB	160	660	380					
3rd Avenue	NB	1,400	1,720	600	3rd Avenue/ Industrial Way	WBR	60	120	80
						NBT	1,000	1,320	200
					Industrial Way/ California Way	SBL	120	120	N/A
	SB	340	1,740	820		NBR	80	80	
						EBT	760	1,080	

		2028 No-Action	2028 Exist. Infras.	2028 Plan. Infras.			2028 No-Action	2028 Exist. Infras.	2028 Plan. Infras.
Crossing Name (USDOT Crossing ID)	**Road Movement[b]**	**Estimated Queue Length at Crossing (feet)**			**Intersection Affected by Queue from Crossing**	**Intersection Movement[c]**	**Estimated Queue Length at Intersection (feet)**		
Dike Road	NB	60	80	100	None	N/A	N/A	N/A	N/A
	SB	100	120	140					
	WB	80	80	80					

Notes:

[a] Shaded gray values indicate a study crossing or intersection with a queue that exceeds available storage for the scenario. Shaded black values indicate an adverse queuing impact.

[b] MVMT= Roadway movement approaching the rail crossing; NB = northbound; SB = southbound; EB = eastbound; WB = westbound

[c] MVMT= Movement at nearby intersection affected by queue from rail crossing; NBL = northbound left; NBR = northbound right; NBT = northbound through; SBL = southbound left; SBR = southbound right; SBT = southbound through; EBL = eastbound left; EBR = eastbound right; EBT = eastbound through; WBL = westbound left; WBR = westbound right; WBT = westbound through; N/A = data not available

Project-related trains would increase total gate downtime over 130 minutes during an average day at public study crossings along the Reynolds Lead and BNSF Spur without track improvements. In a 24-hour period, project-related trains would increase the probability of emergency response vehicles being delayed by the following:

- 10% at study crossings along the Reynolds Lead and BNSF Spur with existing track infrastructure
- 5% at study crossings along the Reynolds Lead and BNSF Spur with planned track infrastructure

The impact on emergency vehicle response would depend on the location of the origin and destination of the response incident in relation to the at-grade crossings along the Reynolds Lead and BNSF Spur. The potential for project-related trains to affect emergency response would also depend on whether the dispatched emergency vehicle would need to cross the rail line and the availability of alternative routes if a project-related train occupies the crossing at the time of the call.

Predicted Accident Probability

An accident probability analysis was conducted using the FRA GradeDec.Net web-based software. GradeDec.Net contains a predicted accident probability module based on the USDOT accident prediction and severity formula.

The predicted accident probability with existing crossing safety protection at the 3rd Avenue (SR 432) study crossing along the Reynolds Lead would be 0.026 accident per year under the No-Action Alternative, and 0.042 accident per year under the On-Site Alternative (Table 6.3-11). Project-related trains would result in an adverse vehicle safety impact at the 3rd Avenue crossing.

Table 6.3-11. 2028 Predicted Accident Probability

	Predicted Accidents (accidents/year)	
Crossing	No-Action Scenario	2028 Proposed Export Terminal Scenario
Project Area Access at 38th Avenue	0.011	0.035
Weyerhaeuser Access at Washington Way	0.018	0.027
Weyerhaeuser NORPAC Access	0.016	0.031
Industrial Way	0.016	0.025
Oregon Way	0.022	0.038
California Way	0.012	0.020
3rd Avenue	0.026	0.042
Dike Road	0.014	0.020

6.3.5.2 Off-Site Alternative

This section describes the potential impacts of construction and operation of the proposed export terminal at the Off-Site Alternative location.

Construction—Direct Impacts

Construction of the proposed export terminal the Off-Site Alternative location would generate the same number of vehicle trips as the On-Site Alternative. Direct impacts during construction would be the same as described for the On-Site Alternative, except construction vehicles would access the project area for the Off-Site Alternative via a new private driveway on Mt. Solo Road.

Construction—Indirect Impacts

Construction of the proposed export terminal at the Off-Site Alternative location would result in the following indirect impacts.

Vehicle Delay

Average vehicle delay, peak hour vehicle delay, and queuing at study crossings would be the same as the On-Site Alternative at all study crossings, except at the crossing of the Reynolds Lead at 38th Avenue. Average vehicle delay, peak hour vehicle delay, and queuing at this study crossing and queue lengths at the Industrial Way/38th Avenue intersection would be less than the On-Site Alternative because construction vehicles associated with the terminal would not use this crossing under the Off-Site Alternative.

Under the Off-Site Alternative, it is anticipated the driveway on Mt. Solo Road that provides access to the Off-Site Alternative project area would be controlled with a stop sign. Mt. Solo Road would continue to be free-flow and would not introduce a new stop sign or intersection signal at the project area access driveway that would substantially slow operations on Mt. Solo Road. Under the truck delivery scenario, trucks entering and exiting the project area access driveway could slow traffic on Mt. Solo Road but would not be expected to substantially change vehicle operations on Mt. Solo Road. The turning movements of trucks to and from Mt. Solo Road would decrease vehicle safety conditions and increase the potential for a crash compared to the No-Action Alternative because a new access point with truck turning movements would be introduced on Mt. Solo Road.

The driveway would cross the rail loop in the project area more than 3,000 feet from Mt. Solo Road. Therefore, vehicle queueing at this at-grade crossing in the project area would not affect vehicle operations on Mt. Solo Road.

Emergency Vehicle Response

This impact would be the same as described for the On-Site Alternative.

Predicted Accident Probability

This impact would be the same as described for the On-Site Alternative.

Operations—Direct Impacts

The Off-Site Alternative would generate the same number of vehicle trips as the On-Site Alternative during operations. Direct impacts during operations would be the same as the On-Site Alternative, except vehicles would access the project area for the Off-Site Alternative via a new private driveway on Mt. Solo Road.

Operations—Indirect Impacts

Construction of the Off-Site Alternative would result in the following indirect impacts on vehicle transportation.

Vehicle Delay

Average vehicle delay, peak hour vehicle delay, and queuing at study crossings would be the same as the On-Site Alternative at all study crossings, except at the crossing of the Reynolds Lead at 38th Avenue. Average vehicle delay, peak hour vehicle delay, and queuing at this study crossing and queue lengths at the Industrial Way/38th Avenue intersection would be less than the On-Site Alternative because vehicles associated with the terminal operations would not use this crossing under the Off-Site Alternative.

Under the Off-Site Alternative, it is anticipated the driveway on Mt. Solo Road that provides access to the Off-Site Alternative project area would be controlled with a stop sign. Mt. Solo Road would continue to be free-flow (not controlled by a stop sign or intersection signal). Therefore, vehicle trips to and from the project area would not substantially change vehicle operations on Mt. Solo Road. Vehicle turning movements to and from Mt. Solo Road would decrease vehicle safety conditions and increase the potential for a crash compared to the No-Action Alternative because a new access point with turning movements would be introduced on Mt. Solo Road.

The private driveway would cross the rail loop in the project area more than 3,000 feet from Mt. Solo Road. Therefore, vehicle queueing at this crossing in the project area would not affect vehicle operations on Mt. Solo Road.

Emergency Vehicle Response

This impact would be the same as described for the On-Site Alternative.

Predicted Accident Probability

This impact would be the same as described for the On-Site Alternative.

6.3.5.3 No-Action Alternative

Under the No-Action Alternative the Corps would not issue a Department of the Army permit authorizing construction and operation of the proposed export terminal. As a result, impacts resulting from constructing and operating the export terminal would not occur. In addition, not constructing the export terminal would likely lead to expansion of the adjacent bulk product business onto the On-Site Alternative project area. The following discussion assesses the likely consequences of the No-Action Alternative regarding vehicle transportation.

Vehicle transportation conditions in 2018 would be as follows.

- **24-hour average vehicle delay.** All study crossings would continue to operate at level of service A (Table 6.3-4).
- **Peak hour vehicle delay.** All study crossings would operate level of service C or better (Table 6.3-5).
- **Vehicle queuing.** Vehicle queues extending from six study crossings (all along the Reynolds Lead) would affect seven nearby intersections (Table 6.3-6). Vehicle queues at these intersections would exceed the available storage length at four approaches during the peak hour. These queues could potentially block other movements at these intersections and affect vehicle delay. No study crossings would exceed available storage length on the BNSF Spur.
- **Vehicle safety.** The No-Action Alternative would not have an adverse impact on vehicle safety because the predicted accident probability was found to be below the benchmark used for the analysis (Table 6.3-7).

A limited-scale future expansion scenario proposed by the Applicant was evaluated, as described in Chapter 3, *Alternatives*. Under this scenario, approximately 2 trains per day would use the Reynolds Lead and BNSF Spur. The following provides a summary of vehicle transportation conditions in 2028 for this scenario.

- **24-hour average vehicle delay.** All study crossings would operate at level of service A (Table 6.3-8).
- **Peak hour vehicle delay.** Study crossings on the Reynolds Lead and BNSF Spur would operate at level of service C or above (Table 6.3-9).
- **Vehicle queuing.** Vehicle queues extending from seven study crossings (six along the Reynolds Lead) would affect eight nearby intersections during the peak hour (Table 6.3-10). Vehicle queues at these intersections would exceed the available storage length at four approaches and affect vehicle delay. These queues could potentially block other movements at these intersections.
- **Vehicle safety.** The No-Action Alternative would not have an adverse impact on vehicle safety because the predicted accident probability was found to be below the benchmark used for the analysis (Table 6.3-11).

6.3.6 Required Permits

No permits related to vehicle transportation would be required for the proposed export terminal.